angle is equal to the rectangle contained by the segments of the base.

8. If x, y, z, be the perpendiculars from the angles of a triangle on the opposite sides, and if

$$\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=\frac{2}{\sigma},$$

prove that

$$4\sqrt{\frac{1}{\sigma}\left(\frac{1}{\sigma}-\frac{1}{x}\right)\left(\frac{1}{\sigma}-\frac{1}{y}\right)\left(\frac{1}{\sigma}-\frac{1}{z}\right)}=\frac{1}{\text{area of triangle}}.$$

IV. Prove that every power of the sum of two squares may be divided into two parts, each of which is the square of an integer.

V. Find the sum of the series

$$\frac{4}{1\cdot5}+\frac{9}{5\cdot14}+\frac{16}{14\cdot30}+\frac{25}{30\cdot55}+\ldots\ldots \text{ to } n \text{ terms.}$$

the last factor in the denominator being the sum of the other factor and the numerator.

VI. If n be prime, prove that any number in the scale whose radix is $2n$ ends in the same digit as its n^{th} power.

VII. If $\frac{p_r}{q_r}$ be the r^{th} convergent to $\frac{\sqrt{5}+1}{2}$ prove that

$$p_3+p_5+\ldots\ldots+p_{2n-1}=p_{2n}-p_2,$$
$$q_3+q_5+\ldots\ldots\quad q_{2n-1}=q_{2n}-q_2.$$

VIII. Find the number of combinations that can be made out of the letters in the following line:

$$\alpha\pi\alpha\pi\pi\alpha\pi\alpha\iota,\ \pi\alpha\pi\alpha\pi\pi\alpha\pi\pi\alpha\pi\alpha\pi\pi\alpha\pi\alpha\iota.$$

taking them (1) 5 together, (2) 25 together.

IX. If $\varphi(r)=\lfloor n\left\{\frac{1}{\lfloor r\ \lfloor n-r}+\frac{1}{\lfloor r-1\ \lfloor n-r+1}\cdot r+\frac{1}{\lfloor r-2\ \lfloor n-r+2.}\cdot\frac{(r-1)(r-2)}{1\cdot2}+\ldots\right\}$

prove that

$$2[\varphi(0)+\varphi(1)+\ldots\ldots+\varphi(n-1)]+\varphi(n)=3^n.$$

X. Eliminate x, y, z from the simultaneous equations

$$\begin{cases}\frac{\alpha}{x}=\frac{1}{y}+\frac{1}{z}\\ \frac{\beta}{y}=\frac{1}{z}+\frac{1}{x}\\ \frac{\gamma}{z}=\frac{1}{x}+\frac{1}{y}\end{cases}$$

Why are these three equations sufficient for the elimination of the three unknowns?

11. If $A+B+C=\frac{\pi}{2}$, shew that

(1) $\cot A+\cot B+\cot C=\cot A\cot B\cot C$.

(2) $\tan A+\tan B+\tan C=\tan A\tan B\tan C+\sec A\sec B\sec C$.

12. ABC is an equilateral triangle; circles are described on AB and AC as diameters; tangents are drawn through the points B and C. Prove that the radius of the circle touching these tangents and the two circles is very nearly one-eighth of the side of the side of the triangle.

13. On the side BC of the triangle ABC are drawn two equilateral triangles, $A'BC$ and $A''BC$; likewise, the equilateral triangles $B'CA$, $B''CA$ and $C'AB$, $C''AB$ are drawn on the sides CA and AB respectively. Prove that

$$A'A\cdot AA''=B'B\cdot BB''=C'C\cdot CC''.$$

XIV. If (p, q, r) be the perpendiculars on the sides of a triangle ABC from the centre of the circumscribing circle, prove that

$$aqr+brp+cpq=\frac{abc}{4}.$$

XV. A circle is described through the foci of an ellipse and any point on its circumference. Two tangents are drawn to this circle through one extremity of the major axis. Shew that the locus of the points of contact of these tangents is a circle whose radius is equal to the minor axis of the ellipse.

16. CP, CD are conjugate semi-axis of an ellipse; PNE is drawn parallel to the minor axis CB, meeting the major axis in N and CD in E. Prove that the area of the triangle

$$PCE \text{ is } = 2\,CB^2\cdot\frac{PN}{CN}.$$

17. OA and OB are asymptotes of a hyperbola; CEI a tangent perpendicular to OA; from C the foo. of this perpendicular CD is drawn at right angles to OB. Prove that every perpendicular drawn from the curve to CD or CD produced will subtend at E, where the tangent CEI meets the hyperbola, a constant angle.

18. TP, TQ are two tangents to an ellipse at right angles to one another, S a focus, prove that

$$\sin^2 SPT+\sin^2 SQT=\text{constant}.$$

Practical Department.

ELOCUTIONARY STUDIES.

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MARK ANTONY'S ORATION.

(Julius Cæsar, Act III., Sc. II.)

Passages of great dramatic power and excitement follow the announcement of Antony to the people that he holds in his hands the will of Cæsar. He affects to restrain their wild violence, yet by hints and suggestions he whets their appetites to fury. Skilfully, yet as if by accident, he says

"Tis good you know not that you are his *heirs*;
"For if you should, O what would *come* of it!"

The manner of saying this depends so much on a full conception of its spirit, of the assumed terror of doing wrong, of exciting his audience to commit the violence to which he is inevitably urging them, that no hard rules will suffice, the reader must conceive and interpret as poet and actor, to do the passage justice.

But now we enter upon a passage in which Shakspeare combines the profoundest knowledge of character with the highest efforts of oratorical skill and passion. The multitude has been conquered, won over to his designs. But that is not enough. Antony's purpose is to destroy the murderers of Cæsar, and that purpose and destruction must have all the semblance of public virtue and justice. He must hurl the vengeance of public wrath, roused to fury on their heads, and conceal his motive under the semblance of pity for the dead.

Let the student mark now that the speaker descends in obedience to the demand of the people, professedly to read the will, but in reality to strengthen every sentiment of pity and horror for the crime and of hatred against the assassins. He therefore holds up the mantle rent with their daggers and covered with the blood of Cæsar. It is a human instinct to pity the dead. Its solemn aspect, its silent helplessness is an appeal to our best and tenderest sympathies. We forgive our very enemies, when death has taken away power to harm us. But Cæsar had made the people his heirs—they had no reason to doubt his generosity. Yet Antony knows the triumph of Roman arms was dearer to Roman patriotism and national pride than the richest legacies. So, holding up the mantle covered with the blood of Cæsar before their eyes, that they may feel how great a national loss they have had, he reminds them that the first time he ever put on this dreadful witness of cruelty and ingratitude he had "overcome the Nervii," "the stoutest warriors of all the Belgæ," when Cæsar had exhibited the highest valour